

HIGH COMMISSIONING COSTS LIMIT DIMMING APPLICATIONS

Photosensors and associated control systems can dim or raise fluorescent lighting systems to decrease or increase the electrical lighting used as the amount of daylight changes during the day. However, such daylighting control systems may require extensive and costly set-up (commissioning) to ensure proper operation, and they do not always provide consistent, accurate light levels.

These issues make daylight dimming systems expensive while providing inconsistent operation, thereby limiting user acceptance.

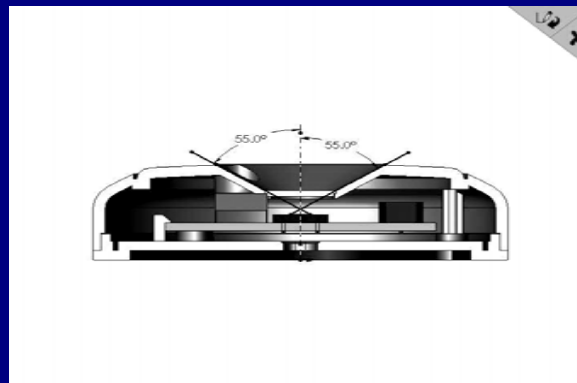
A new photosensor has been developed to achieve the following objectives:

- Provide accurate control of the electric lights in response to changes in the available daylight by maintaining the target setpoint
- Make the setup and adjustment of the control system fast and repeatable

The new system allows the user to quickly commission the photosensor and calibrate light levels using a remote hand-held tool. The control system has the potential to reduce lighting energy use in classrooms by 60 percent, reduce lighting demand in controlled spaces by 40 percent during peak periods, and reduce the commissioning time of installing and setting up photosensor control.

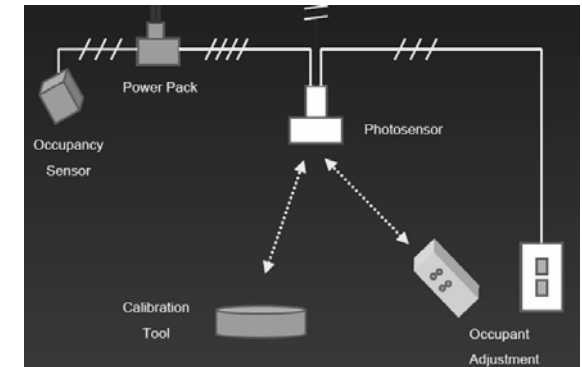
SELF-COMMISSIONING CLASSROOM PHOTOSENSOR AND CONTROL SYSTEM

PIER RESEARCHERS DEVELOPED A NEW PHOTOSENSOR AND LIGHTING CONTROL SYSTEM THAT OPTIMIZES THE INTERACTION BETWEEN COMMON CLASSROOM ELECTRIC LIGHTING SYSTEMS AND DAYLIGHTING. THE SYSTEM HANDLES SEVERAL DAYLIGHTING CONFIGURATIONS: SIDE-LIGHTING ONLY, TOP-LIGHTING ONLY, AND SIDE- AND TOP-LIGHTING COMBINED. SIMPLE AND EASY TO COMMISSION, THE SYSTEM EFFECTIVELY OPERATES WITH MANUAL CONTROLS AND OCCUPANCY SENSORS.



Cross-section of the new photosensor prototype

CUT INSTALLATION COST AND IMPROVE USER SATISFACTION



The classroom photocell and control system

Benefits

- Self-commissioning desktop tool significantly cuts commissioning and calibration time.
- Advanced photosensor design accurately senses daylight availability, cutting electric light usage 40–60 percent or more depending on space design.
- Control system automatically tunes the electric lighting to the desired light levels.
- System may include a wall switch to let occupants turn lights on and off, or raise and lower the target light level.
- Integrated power pack, photosensor, commissioning tool, and occupant adjustment control speeds installation.
- Low-voltage wiring simplifies installation.
- Design is optimized for classrooms and other instructional spaces, but is also appropriate for standard offices.

INTERESTED?

School and university facility managers, contractors, lighting designers and specifiers, engineers, code developers, and utility staff can use the information on the classroom photosensor and control system.

Key next steps include:

- Complete development of system components.
- Commercialize the system.
- Conduct demonstrations in well daylit classroom/instructional spaces.
- Document energy savings and teacher/student acceptance.
- Educate school and university facility managers on system benefits and availability.
- Educate system designers on the benefits compared with standard technologies.

This project was part of the PIER Lighting Research Program. To view the project results, as well as other current research activities, visit www.energy.ca.gov/pier.

Additional information about this technology can be found on the following web sites:

- PIER contractor site:
www.archenergy.com/lrp/demand_resp_lighting/project_3_3.htm
- PIER researcher site:
http://lighting.lbl.gov/l_controls.html



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Contact Information

California Energy Commission
www.energy.ca.gov/pier
Michael Seaman
mseaman@energy.state.ca.us

Architectural Energy Corporation
www.archenergy.com/lrp
Judie Porter
jporter@archenergy.com

The Watt Stopper
www.wattstopper.com
Doug Paton
Doug_Paton@Wattstopper.com



Arnold Schwarzenegger, *Governor*
California Energy Commission
Chair: Jackalyne Pfannenstiel
Vice Chair: James D. Boyd
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CLASSROOM PHOTOSENSOR AND CONTROL SYSTEM



SELF COMMISSIONING CUTS INSTALLATION COSTS



Public Interest
Energy Research